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SO_2 allowances...

sions related to trades and compliance, total energy demand, technology development, and fluidity of the market, said John Metzler, of AER*X, an emissions trading firm based in Washington, DC. Other factors include environmental regulations influencing coal prices, and how the air toxics section is written, Metzler said.

Allocations to existing units were based on an emissions rate multiplied by the unit's average fuel consumption from a 1985-1987 baseline period.

Fines for not holding enough allowances result in penalties, including $2000 per ton, far higher than the likely market price of allowances. Excess allowances, gained by installing pollution controls or other ways, can be sold.

Several allowance trades have occurred, placing allowance value at $250-350. (See related story and *EL&P*, 6/92, p. 1)

Bonus allowances, available for certain plants from 2000 to 2009, will help accommodate expected economic and population growth, EPA said. Congress limited these to 530,000 a year. The Midwest and South get 50,000 extra per year starting in 2000.

The EPA proposal establishes four kinds of reserves. The Phase 1 extension reserve has up to 3.5-million allowances annually for 90-percent SO_2 removal or greater. The Conservation and Renewable Energy Reserve contains 300,000 total allowances for related EPA-approved measures. Clean coal technlogy gets a bonus if applied on higher emitting coal-fired plants.

The auction and sale programs get up to 2.8 percent of all allowances, providing an opportunity for new generators to obtain allowances, EPA noted.

For some utilities, exceptions to the proposed regulation didn't extend far enough. The EPA proposed that six utilities receive additional basic allowances as they requested, but 20 utilities seeking added exceptions for their plants didn't make EPA's proposed cut.

Among the rejections was Portland General Electric Corp.'s Boardman plant. PGE's request for 8,265 additional basic allowances was the largest single-plant rejection. Duke Power was denied 14,348 allowances for five plants.

Boardman, under economy shutdown during most of the baseline period, was given few allowances. Without obtaining a legislative exception, or additional allowances, PGE will only be able to operate the plant at 65-percent capacity from 2000-2009 and just 7 percent capacity after the year 2000, explained PGE's Roxanne Bailey.

Boardman burns low-sulfur coal with less than 0.5-percent sulfur. PGE operates and owns 65 percent of the 530-MW unit.

When asked about Boardman and similarly affected plants, McLean explained, "There was no perfect way to deal with the situation."

McLean said, "That's why there were bonus allowances put in, along with special provisions, for Boardman, and other plants in similar situations."

He said that some very clean plants came online in the early 1980s but operated for just short periods during the baseline. A three-year period intended to provide a more moderating period than a single year, McLean noted.

"I think EPA understands these utilities' situations," McLean said. "We had to make some tough decisions."

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DSM opportunities...

competitive bidding. Wisconsin Public Service Corp. started a program similar to WEPCO's, with room air conditioners worth the same $50 bond as refrigerators and freezers. American Electric Power is piloting the plan in central Ohio (in parts of Columbus Southern and Ohio Power territories).

In 1991, Niagara Mohawk started a four-year, 34,000-unit contract with Planergy, an Austin, TX-based company. This plan deals only with second refrigerators. It's unique in that the contractor handles the marketing (stuffers, TV, radio, newspapers) and disburses incentives at $50 per unit. Incentives and marketing are rolled into the fee.

Niagara Mohawk is proceeding on a region-by-region basis, limiting pickups to relatively short hauls into Syracuse. More distant points may be served by satellite plants or by mass hauling from scattered collection points.

In Bison, SD, tiny Grand Electric has met part of the recycling dilemma by getting its own $4,000 CFC reclaiming-recycling unit. Grand is also a Carrier and General Electric appliance servicing dealer, so reclaims the refrigerant from all trade-ins before scrapping them.

There's no question that appliance recycling, particularly second refrigerators, offers substantial benefits to customers, utilities, and society. Why haven't more utilities signed on?

Not all utilities are regulated; not all regulators have mandated DSM; not all regulators allow pass-through of DSM costs, not all utilities have or foresee near-to mid-term generating capacity problems that might encourage such programs. And even if all conditions suggest DSM, it takes time to evaluate some 200-odd options, to choose, budget, and implement the programs.

But are utilities interested? Both ARCA and Planergy say there's plenty of interest, and both look forward to expanding.

Program costs vary according to services desired, volume of appliances, length of contract, and transportation required, said John Cameron, ARCA president.

For one utility, the maximum economic haul is 150 to 200 miles. Enough volume to justify a recycling facility, often in or near an urban center, can help keep costs low. But cost-effective programs operate in rural areas, as well.

"Utilities who have used us find [appliance recycling] to be cost effective as far as DSM programs are concerned," Cameron said.

Climate, CO_2 get global attention

Science remains uncertain that carbon dioxide and other emissions cause global warming, or to what degree cuts would change any global climate trends now in progress.

Yet global warming exploded on the world's agenda this year with the United Nation-sponsored "Earth Summit." Because politicians often don't wait for scientific concensus to make policy decisions, many electric utilities aren't waiting either.

Fossil-fired electric generating plants, often singled out for contributing to the greenhouse effect, emit carbon-dioxide (CO_2) as part of combustion.

While removing CO_2 from fossil plant emissions is technically possible, it's still seen as too prohibitively expensive to be practical, said John Palmisano, of AER*X, a compliance planning company.

Even so, Larry Brodsky, a vice president with Illinois Power Co., predicted that within 10 years, the U.S. will embrace CO_2 controls. Present U.S. policy encourages voluntary control.

Until CO_2 scrubbing technology progresses, Palmisano said, utilities will use efficiency and load control, carbon sequestration, and nuclear power to offset CO_2 emissions. Brodsky and Palmisano commented at the most recent American Power Conference.

The Electric Power Research Institute (EPRI) expects electric utilities to lower U.S. CO_2 emissions by 685-million tons by 2010. Electric utility fossil units emitted 1,973-million tons CO_2 in 1990.

Utility contributions

Ways utilities manage CO_2 are to:

- Continue to promote energy efficiency, or demand-side management, which can displace combustion generating resources and prevent carbon from getting into the atmosphere. The Environmental Protection Agency's Green Lights efficiency program, now saves 8.7 MW, or 95-million pounds of CO_2 per year.
- Comply with existing environmental laws. Some strategies to cut other air emissions also cut CO_2.
- Continue growth of non-fossil generation.
- Plant trees or participate in other carbon-storage or cycling efforts. New England Electric System has experimented with an algae farm, while American Electric Power and other utilities look toward tree planting as a way to store carbon. American Public Power Association's Tree Power program aims to plant 16 million trees. An average tree absorbs 26 lb of CO_2 each year, APPA says.
- Commit to cut CO_2 by specified amounts. At least three major utilities have promised to do so. A 5-percent gain in fuel-to-electricity conversion efficiency cuts CO_2 emissions by 10-15 percent, says DOE's Energy Information Administration.
- Promote efficient, electric applications.
- Continue related research.

All sides agree more research is needed on global climate. The EPA says 1988 was the third warmest U.S. summer since 1895, and 1990 was the 15th, but these may be within normal weather variation. Climatologists' estimates on global warming vary widely, from 1°C to 8°C by the year 2100. Interactions from a myriad of climatic inputs make simple cause-and-effect conclusions uncertain.

"The relationship of CO_2 and global warming is simply not known. We ought to know what we're doing before we do it," said James Watkins, secretary of the Department of Energy at the recent APPA Annual Conference.

Uncertainties include the effects of cloud cover, ocean currents, emissions of CO_2 and SO_2, volcanic activities, the speed of re- and deforestation effects, and limits to how much data can go into computer models. Despite uncertainties, and voluntary emission cuts, some say the risks of adverse global changes from warming warrant immediate mandates. Additional fears result because others say capping world emissions now might take many decades to reverse momentum of global climatic trends.

Also, general media, by their nature, can raise anxieties by accentuating extremes in headlines and sound bites, often without time or space to place things in context.

Earth Summit

Global warming concerns helped feed intense international pressure before and during the Earth Summit in Rio de Janeiro. Many world leaders at the 12-day meeting sought U.S. commitments to cap and make firm deadlines for CO_2 reductions. Negotiators for President Bush managed to revise an international treaty allowing flexibility without mandates.

The resulting UN treaty on global climate change starts when 50 nations sign. It includes voluntary reductions, research, progress reports, and provisions to modify guidelines based on research results.

DOE's Watkins said criticism directed at the U.S. has been undeserved. "We are the world leader in environmental protection," he said, adding that proposed 1993 spending on global climate is $1.4 billion, "more than all other nations combined."

Scientific and economic progress can help impoverished people develop sustained growth and protect the environment, Watkins said.

Even so, many people believe global warming is a very serious problem (see chart), according to a 22-nation, three-year survey by the George H. Gallup Institute presented at the Earth Summit.

U.S. utility customers feel that protecting the environment should be their utility's most important role, followed by keeping rates low, and conserving energy, according to a separate, May '92, Gallup survey.

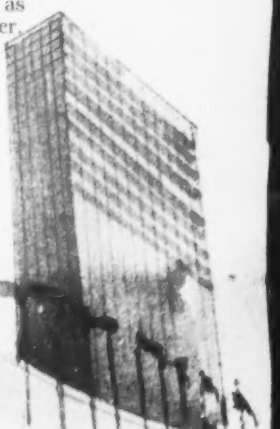
More electricity

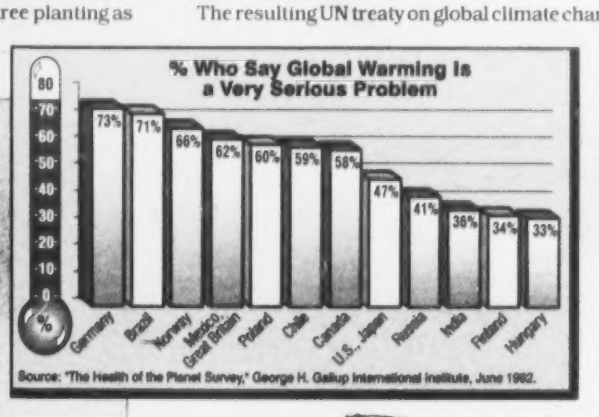
Using more electricity and using it more efficiently means total U.S. energy use can decrease by the year 2000 while environmental benefits increase, said Richard Balzhiser, EPRI president.

"This is a powerful but counter-intuitive message that must be understood by environmental and consumer interests," said Balzhizer at APPA's meeting.

Of EPRI's estimated 685-million-ton cut in CO_2 emissions by 2010, more than half will come from using more electricity to displace more CO_2-intensive energy. Advantages of electric technologies, according to EPRI and Edison Electric Institute, include:

- Electric vehicles, which are 60 percent more energy efficient than gasoline counterparts.
- Fax machines, seven times as energy efficient as express courier.
- Steel making, 50 percent more efficient.
- Microwave, 90 percent more efficient for cooking.





Source: "The Health of the Planet Survey," George H. Gallup International Institute, June 1992.

Utility programs save energy, the environment

In Ohio, American Electric Power's Columbus Southern Power Co. and Ohio Power Co. began in mid-1991 to save energy and the ozone layer with Project Good Turn. In 1992, AEP expanded the program for all its Ohio customers.

By a toll-free call to Appliance Recycling Centers of America Inc. (ARCA), utility customers can get an old, energy guzzling refrigerator removed at no charge. AEP calculates that each old refrigerator adds as much as $9 per month onto a home's electricity consumption.

ARCA captures refrigerant gases—mainly chlorofluorocarbons (CFCs), which can damage the ozone layer if emitted. CFCs and energy inefficiency also may contribute to the suspected greenhouse effect.

PCB-contaminated capacitors are removed and incinerated, under government rules. Mercury switches are sent to a mercury reclamation company. Metals are reprocessed. Only insulation and plastic remain to be sent to a landfill.

Said Dale E. Heydlauff, vice president of environmental affairs for AEP Service Corp., "We're demonstrating the company's commitment to the environment." As of mid-June, Columbus Southern had arranged for more than 10,000 refrigerators to be recycled.

Other utilities have similar programs. Wisconsin Electric Power Co. disposed of 250,000 inefficient appliances in five years.